

Use Attainability Analysis

for

WBID 0349 Pigeon Creek

Submitted by
SES Inc.

to

Missouri Department of Natural Resources
Water Protection Program

Date received: November 14, 2007

Field Data Sheets for Recreation Use Stream Surveys

Data Sheet A - Water Body Identification

I. Water Body Information (For water body being surveyed)

Water Body Name (from USGS 7.5' quad):	Pigeon Cr.
Missouri Water Body Identification (WBID) Number:	349
8 digit HUC code: 10240012	County: Buchanan
Upstream Legal Description (from Table H):	T56N R35W SEC15
Downstream Legal Description (from Table H):	T56N R34W SEC21
Number of sites evaluated:	4
List all site numbers, listed consequently upstream to downstream:	1, 2, 3, 4

Site Locations Map(s): Attach a map of the entire segment with assessment sites clearly labeled.
Mark any other items that may be of interest.

II. Facility Information (list all permitted discharges to the water body segment)

Facility Name(s) and Permit Number(s):
St Joseph Sani Landfill
MO0109878

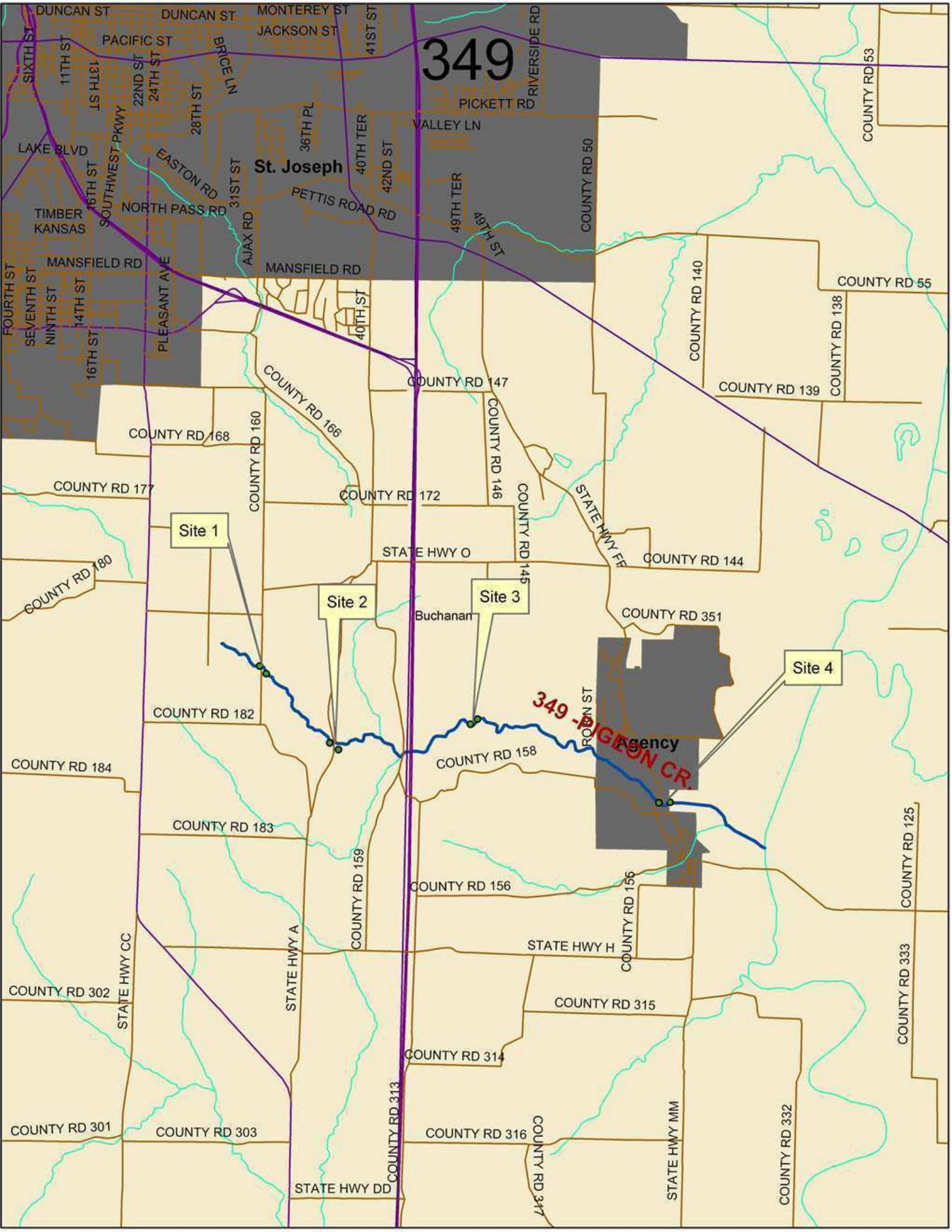
III. UAA Surveyor (please print legibly)

Name of Surveyor: Gilisa Gould	Telephone Number: 9133070054
Organization/Employer: SES, Inc.	

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Signed: Gilisa Gould

Date: 11.08.07



WBID # 349
 Site # 1

Field Data Sheets For Recreational Use Stream Surveys

Data Sheet B-Site Characterization

Date & Time: 10.8.07 4:30	Site Location Description (e.g. road crossing):
Personnel: G. Gould and L. Brown	160 road crossing
Current Weather Conditions: clear	Facility Name: St. Joseph Sani Landfill
Weather conditions for the past 10 days: 0.96 inches	Permit Number: MO0109878
Drought conditions?: No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

Location Coordinates (Universal Transverse Mercator Projection, In Meters)					
Site 01	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy:	Meters	
	0344455	4392532		7.62	
Site 11	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy:	Meters	
	0344554	4392458		8.5	

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
5	upstream	6	downstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed:

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water Skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe:				

WBID # 349
Site # 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B- Site Characterization (Continued)

Surrounding Conditions:

<input type="checkbox"/> City/County parks	<input type="checkbox"/> playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National Forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkways
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep Slopes	<input checked="" type="checkbox"/> Other:
Comments: construction on road crossing				

Evidence of Human Use:

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot path/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV/ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock watering
comments/other: none				

Substrate:

% Cobble	% Gravel	% Sand	% Silt 100	% Mud/Clay	% Bedrock
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Aquatic Vegetation:

none

Water Characteristics:

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input checked="" type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

WBID # ____ 349 ____
Site # ____ 1 ____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

none

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: _____ Gilisa Gould _____ Date of Survey: _____ 10/8/2007 _____

Organization: _____ SES, Inc. _____ Position: _____ Field Team Leader _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Waterbody ID: <u>349</u> Site #: <u>1</u> Estimated Channel Incision: <u>6.0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0344455</u> UTM Y: <u>4392532</u> +/- <u>7.62</u> (meters) 11 UTM X: <u>0344554</u> UTM Y: <u>4392458</u> +/- <u>8.5</u> (meters) Average Stream Width: <u>2</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Larissa Brown and Gilisa Gould</u>	Dissolved Oxygen Date: <u>10.8.07</u> Time: <u>4:30</u> Dissolved Oxygen: <u>2.5</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>23.7</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.1	0.01	0.1	0.05	0.1	0.05	0.1	0.01	0.1	0.05	0.2	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.10	0.1	0.01
2	0.2	0.05	0.2	0.05	0.2	0.05	0.1	0.05	0.2	0.01	0.4	0.01	0.1	0.00	0.0	0.01	0.1	0.10	0.2	0.15	0.1	0.01
3	0.3	0.05	0.3	0.05	0.3	0.01	0.2	0.10	0.3	0.05	0.6	0.01	0.2	0.00	0.1	0.05	0.2	0.15	0.3	0.15	0.2	0.05
4	0.4	0.05	0.4	0.00	0.4	0.01	0.2	0.10	0.4	0.01	0.8	0.01	0.2	0.01	0.1	0.05	0.2	0.15	0.4	0.20	0.2	0.05
5	0.5	0.01	0.5	0.00	0.5	0.00	0.3	0.10	0.5	0.01	1.0	0.01	0.3	0.05	0.2	0.05	0.3	0.15	0.5	0.15	0.3	0.05
6	0.6	0.01	0.6	0.01	0.6	0.01	0.3	0.10	0.6	0.01	1.2	0.01	0.3	0.10	0.2	0.05	0.3	0.15	0.6	0.15	0.3	0.05
7	0.7	0.01	0.7	0.00	0.7	0.00	0.4	0.05	0.7	0.01	1.4	0.01	0.4	0.10	0.3	0.05	0.4	0.05	0.7	0.10	0.4	0.01
8	0.8	0.01	0.8	0.01	0.8	0.01	0.4	0.01	0.8	0.00	1.6	0.00	0.4	0.05	0.3	0.05	0.4	0.05	0.8	0.05	0.4	0.01
9	0.9	0.01	0.9	0.01	0.9	0.00	0.5	0.01	0.9	0.01	1.8	0.01	0.5	0.01	0.0	0.05	0.5	0.05	0.9	0.05	0.5	0.01
Right Bank	1.0	1.00	1.0	0.50	1.0	0.00	0.5	0.00	1.0	0.00	2.0	0.00	0.5	1.00	0.5	0.00	0.5	0.00	1.0	0.00	0.5	0.00
Feature Type (riffle, run, or pool)	pool		riffle		riffle		pool		riffle		riffle		riffle		pool		pool		pool		pool	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Signed: Gilisa Gould Date: 10/2/07

WBID # 349
 Site # 2

Field Data Sheets For Recreational Use Stream Surveys

Data Sheet B-Site Characterization

Date & Time:	10.8.07	5:30pm	Site Location Description (e.g. road crossing):
Personnel:	L. Brown and G. Gould		
Current Weather Conditions:	clear	Facility Name:	St. Joseph Sani Landfill
Weather conditions for the past 10 days:	0.96 inches	Permit Number:	MO0109878
Drought conditions?: No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>			

Site Location:

Location Coordinates (Universal Transverse Mercator Projection, In Meters)			
Site 01	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: Meters
	0345447	4391444	7.3
Site 11	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: Meters
	0345577	4391333	7.9

Photos:

Photo ID#	Photo Purpose	Photo ID#:	Photo Purpose	Photo ID#:	Photo Purpose
7	upstream	8	downstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed:

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water Skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe:				

WBID # 349
 Site # 2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B- Site Characterization (Continued)

Surrounding Conditions:

<input type="checkbox"/> City/County parks	<input type="checkbox"/> playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National Forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkways
<input type="checkbox"/> Boating accesses	<input checked="" type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep Slopes	<input type="checkbox"/> Other:
Comments: <div align="center">none</div>				

Evidence of Human Use:

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot path/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV/ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock watering
comments/other: none				

Substrate:

% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
	10		40	20	30

Aquatic Vegetation:

None

Water Characteristics:

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other:
					Brown
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input checked="" type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

WBID # 349
Site # 2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

none

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: Gilisa Gould Date of Survey: 10/8/2007

Organization: SES, Inc. Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Waterbody ID: <u>349</u> Site #: <u>2</u> Estimated Channel Incision: <u>4.0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0345447</u> UTM Y: <u>4391444</u> +/- <u>7.3</u> (meters) 11 UTM X: <u>0345577</u> UTM Y: <u>4391333</u> +/- <u>7.9</u> (meters) Average Stream Width: <u>3</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Larissa Brown and Gilisa Gould</u>	Dissolved Oxygen Date: <u>10.8.07</u> Time: <u>5:30</u> Dissolved Oxygen: <u>0.2</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>22.9</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.1	0.05	0.1	0.01	0.2	0.01	0.2	0.20	0.1	0.01	0.2	0.01	0.2	0.01	0.1	0.01	0.2	0.01	0.2	0.05	0.2	0.30
2	0.2	0.10	0.2	0.01	0.4	0.05	0.4	0.25	0.2	0.05	0.4	0.00	0.4	0.01	0.2	0.01	0.4	0.01	0.4	0.25	0.4	0.30
3	0.3	0.10	0.3	0.00	0.6	0.05	0.6	0.30	0.3	0.05	0.6	0.05	0.6	0.05	0.3	0.05	0.6	0.05	0.6	0.35	0.6	0.25
4	0.4	0.05	0.4	0.01	0.8	0.10	0.8	0.35	0.4	0.10	0.8	0.01	0.8	0.01	0.4	0.05	0.8	0.05	0.8	0.40	0.8	0.25
5	0.5	0.05	0.5	0.01	1.0	0.10	1.0	0.30	0.5	0.10	1.0	0.00	1.0	0.01	0.5	0.10	1.0	0.05	1.0	0.40	1.0	0.20
6	0.6	0.05	0.6	0.05	1.2	0.10	1.2	0.20	0.6	0.05	1.2	0.00	1.2	0.05	0.6	0.10	1.2	0.05	1.2	0.25	1.2	0.25
7	0.7	0.01	0.7	0.00	1.4	0.05	1.4	0.10	0.7	0.05	1.4	0.10	1.4	0.05	0.7	0.10	1.4	0.05	1.4	0.15	1.4	0.25
8	0.8	0.01	0.8	0.01	1.6	0.01	1.6	0.05	0.8	0.01	1.6	0.05	1.6	0.00	0.8	0.05	1.6	0.05	1.6	0.10	1.6	0.15
9	0.9	0.01	0.9	0.01	1.8	0.01	1.8	0.01	0.9	0.00	1.8	0.01	1.8	0.01	0.9	0.05	1.8	0.05	1.8	0.05	1.8	0.05
Right Bank	1.0	0.00	1.0	0.00	2.0	0.00	2.0	0.00	1.0	0.00	2.0	0.00	2.0	0.00	1.0	0.00	2.0	0.00	2.0	0.00	2.0	0.00
Feature Type (riffle, run, or pool)	pool		riffle		pool		pool		pool		riffle		riffle		pool		riffle		pool		pool	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: Gilisa Gould Date: 11.08.07

WBID # 349
 Site # 3

Field Data Sheets For Recreational Use Stream Surveys

Data Sheet B-Site Characterization

Date & Time:	10.9.07	10:45	Site Location Description (e.g. road crossing):
Personnel:	L. Brown and G. Gould		Conservation Area road crossing
Current Weather Conditions:	clear		Facility Name: St Joseph Sani Landfill
Weather conditions for the past 10 days:	0.96 inches		Permit Number: MO0109878
Drought conditions?: No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>			

Site Location:

Location Coordinates (Universal Transverse Mercator Projection, In Meters)			
Site 01	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: Meters
	0347470	4391701	8.2
Site 11	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: Meters
	0347580	4391777	6.0

Photos:

Photo ID#	Photo Purpose	Photo ID#:	Photo Purpose	Photo ID#:	Photo Purpose
9	downstream T11	10	upstream T11	11	height of a bank
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
12	downstream T1	13	upstream, T1		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed:

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water Skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe:				

WBID # 349
 Site # 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B- Site Characterization (Continued)

Surrounding Conditions:

<input type="checkbox"/> City/County parks	<input type="checkbox"/> playgrounds	<input checked="" type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National Forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkways
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep Slopes	<input checked="" type="checkbox"/> Other:
Comments: <div align="center">Very steep slopes</div>				

Evidence of Human Use:

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot path/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV/ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock watering
comments/other: none				

Substrate:

% Cobble 30	% Gravel 5	% Sand 15	% Silt	% Mud/Clay	% Bedrock 50
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Aquatic Vegetation:

None

Water Characteristics:

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other:
	brown				
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input checked="" type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

WBID # 349
Site # 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

none

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: Gilisa Gould Date of Survey: 10/9/2007

Organization: SES, Inc. Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Waterbody ID: <u>349</u> Site #: <u>3</u> Estimated Channel Incision: <u>3.0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0347470</u> UTM Y: <u>4391701</u> +/- <u>8.2</u> (meters) 11 UTM X: <u>0347580</u> UTM Y: <u>4391777</u> +/- <u>6</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Larissa Brown and Gilisa Gould</u>														Dissolved Oxygen					
														Date: <u>10.9.07</u>		Time: <u>10:45am</u>			
														Dissolved Oxygen: <u>4.1</u> (mg/L)					
														Dissolved Oxygen: _____ (% sat)					
														Specific Cond: _____ (µS/cm)					
														Water Temperature: <u>27.7</u> (°C)					

Transect Cross-Section																						
	01		02		03		04		05		06		07		08		09		10		11	
Station	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.5	0.01	0.6	0.05	0.9	0.01	0.8	0.01	0.5	0.05	0.7	0.05	0.8	0.05	0.4	0.05	0.5	0.01	0.4	0.01	0.5	0.05
2	1.0	0.05	1.2	0.15	1.8	0.00	1.6	0.05	1.0	0.10	1.4	0.15	1.6	0.05	0.8	0.15	1.0	0.01	0.8	0.01	1.0	0.15
3	1.5	0.01	1.8	0.20	2.7	0.00	2.4	0.00	1.5	0.10	2.1	0.25	2.4	0.01	1.2	0.15	1.5	0.05	1.2	0.01	1.5	0.25
4	2.0	0.01	2.4	0.25	3.6	0.00	3.2	0.00	2.0	0.05	2.8	0.30	3.2	0.00	1.6	0.15	2.0	0.01	1.6	0.00	2.0	0.20
5	2.5	0.05	3.0	0.25	4.5	0.01	4.0	0.00	2.5	0.05	3.5	0.40	4.0	0.00	2.0	0.15	2.5	0.05	2.0	0.15	2.5	0.15
6	3.0	0.05	3.6	0.20	5.4	0.05	4.8	0.00	3.0	0.10	4.2	0.25	4.8	0.00	2.4	0.20	3.0	0.10	2.4	0.05	3.0	0.10
7	3.5	0.05	4.2	0.15	6.3	0.05	5.6	0.05	3.5	0.05	4.9	0.25	5.6	0.00	2.8	0.15	3.5	0.10	2.8	0.05	3.5	0.10
8	4.0	0.05	4.8	0.10	7.2	0.05	6.4	0.15	4.0	0.10	5.6	0.10	6.4	0.20	3.2	0.05	4.0	0.01	3.2	0.05	4.0	0.10
9	4.5	0.01	5.4	0.05	8.1	0.01	7.2	0.01	4.5	0.01	6.3	0.05	7.2	0.10	3.6	0.05	4.5	0.01	3.6	0.01	4.5	0.05
Right Bank	5.0	0.00	6.0	0.00	9.0	0.00	8.0	0.00	5.0	0.00	7.0	0.00	8.0	0.00	4.0	0.00	5.0	0.00	4.0	0.00	5.0	0.00
Feature Type	riffle		pool		pool		riffle		pool		pool		pool		pool		riffle		riffle		pool	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: Gilisa Gould Date: 11.08.07

WBID # 349
 Site # 4

Field Data Sheets For Recreational Use Stream Surveys

Data Sheet B-Site Characterization

Date & Time:	10.9.07	12:30	Site Location Description (e.g. road crossing):
Personnel:	L. Brown and G. Gould		Hwy ff crossing
Current Weather Conditions:	clear	Facility Name:	St. Joseph Sani Landfill
Weather conditions for the past 10 days:	0.96 inches	Permit Number:	MO0109878
Drought conditions?: No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>			

Site Location:

Location Coordinates (Universal Transverse Mercator Projection, In Meters)			
Site 01	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: Meters
	0350189	4390569	4.6
Site 11	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: Meters
	0350350	4390576	5.2

Photos:

Photo ID#	Photo Purpose	Photo ID#:	Photo Purpose	Photo ID#:	Photo Purpose
14	downstream, T1	15	upstream, T1	16	downstream, T11
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
17	upstream, T11				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed:

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water Skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe:				

WBID # 349
 Site # 4

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B- Site Characterization (Continued)

Surrounding Conditions:

<input type="checkbox"/> City/County parks	<input type="checkbox"/> playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National Forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkways
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep Slopes	<input type="checkbox"/> Other:
Comments: none				

Evidence of Human Use:

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot path/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV/ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock watering
comments/other: none				

Substrate:

% Cobble	% Gravel	% Sand 50	% Silt 50	% Mud/Clay	% Bedrock
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Aquatic Vegetation:

horsetail reed on banks

Water Characteristics:

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other:
	brown				
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

WBID # 349
Site # 4

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (continued)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

none

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Surveyor's Signature: Gilisa Gould Date of Survey: 10.09.07

Organization: SES, Inc. Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Waterbody ID: <u>349</u> Site #: <u>4</u> Estimated Channel Incision: <u>2.0</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0350189</u> UTM Y: <u>4390569</u> +/- <u>4.6</u> (meters) 11 UTM X: <u>0350350</u> UTM Y: <u>4390576</u> +/- <u>5.2</u> (meters) Average Stream Width: <u>5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Larissa Brown and Gilisa Gould</u>																Dissolved Oxygen						
																Date: <u>10.9.07</u> Time: <u>12:50</u> Dissolved Oxygen: <u>6.1</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>21.9</u> (°C)						
Transect Cross-Section																						
01		02		03		04		05		06		07		08		09		10		11		
Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0.4	0.05	0.7	0.05	0.7	0.05	0.5	0.05	0.4	0.05	0.7	0.01	0.5	0.01	0.3	0.05	0.5	0.05	0.8	0.05	0.3	0.01
2	0.8	0.10	1.4	0.30	1.4	0.35	1.0	0.25	0.8	0.05	1.4	0.10	1.0	0.05	0.6	0.20	1.0	0.30	1.6	0.20	0.6	0.05
3	1.2	0.05	2.1	0.65	2.1	0.70	1.5	0.35	1.2	0.15	2.1	0.05	1.5	0.01	0.9	0.20	1.5	0.30	2.4	0.40	0.9	0.05
4	1.6	0.05	2.8	0.95	2.8	0.65	2.0	0.30	1.6	0.25	2.8	0.01	2.0	0.01	1.2	0.15	2.0	0.25	3.2	0.55	1.2	0.10
5	2.0	0.15	3.5	1.00	3.5	0.70	2.5	0.25	2.0	0.40	3.5	0.00	2.5	0.05	1.5	0.15	2.5	0.20	4.0	0.60	1.5	0.10
6	2.4	0.20	4.2	1.00	4.2	0.70	3.0	0.20	2.4	0.35	4.2	0.00	3.0	0.10	1.8	0.10	3.0	0.15	4.8	0.40	1.8	0.10
7	2.8	0.20	4.9	1.00	4.9	0.55	3.5	0.10	2.8	0.30	4.9	0.05	3.5	0.15	2.1	0.05	3.5	0.10	5.6	0.15	2.1	0.10
8	3.2	0.15	5.6	0.95	5.6	0.35	4.0	0.05	3.2	0.15	5.6	0.20	4.0	0.10	2.4	0.05	4.0	0.05	6.4	0.20	2.4	0.10
9	3.6	0.05	6.3	0.90	6.3	0.10	4.5	0.05	3.6	0.15	6.3	0.10	4.5	0.01	2.7	0.01	4.5	0.05	7.2	0.05	2.7	0.05
Right Bank	4.0	0.00	7.0	0.00	7.0	0.00	5.0	0.00	4.0	0.00	7.0	0.00	5.0	0.00	3.0	0.00	5.0	0.00	8.0	0.00	3.0	0.00
Feature Type (riffle, run, or pool)	riffle	pool		pool		pool		pool		pool		pool		pool		pool		pool		pool		

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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All measurements to be taken to the nearest 0.01 meter.

Signed: gilisa gould Date: 11.08.07

WBID# 0349



Site# 1 Photo ID# 5, Upstream



Site# 1 Photo ID# 6, Downstream



Site# 2 Photo ID# 7, Upstream



Site# 2 Photo ID# 8, Downstream

WBID# 0349



Site# 3 Photo ID# 9, Downstream



Site# 3 Photo ID# 10, Upstream



Site# 3 Photo ID# 11, Height of stream



Site# 3 Photo ID# 12, Downstream

WBID# 0349



Site# 3 Photo ID# 13, Upstream



Site# 4 Photo ID# 14, Downstream



Site# 4 Photo ID# 15, Upstream



Site# 4 Photo ID# 16, Downstream

WBID# 0349



Site# 4 Photo ID# 17, Upstream